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and it has become vestigial in the generalized vertebrates, having disappeared altogether in the higher. The speaker commended Loey's paper as a model research, displaying the 'five Cs,' clear, consistent, correct, concise and, so far as possible, complete.

Professor Wilder has long held that the very difficulties of neurology demand its early cultivation and that the elements of this most abstruse natural science, like those of astronomy, should be taught objectively in the primary schools. After trying various forms he concludes that the required pedagogic conditions are best met by the sharks and rays, particularly in respect to the ease with which they may now be had from the supply departments of the numerous marine laboratories; he believed it especially desirable that the beginner should himself lay bare the specimen so as to feel toward it an actual sense of ownership like that of a discoverer. Since the skulls of these fish are of cartilage, the brain can be exposed with the simplest instruments, even a jack-knife, better a small shoe-knife cut off obliquely.

In concluding Professor Wilder declared that the greatest mistake of his scientific life occurred while working on these sharks and rays in 1866-68 for the late Professor Louis Agassiz; he persisted in devoting himself to less noble and significant structures, notwithstanding the gently expressed preference of his too considerate employer. Since 1873 he has lost no opportunity of preparing and dissecting selachian brains, and hopes the present paper may arouse interest in them and lead to the recognition and elucidation of the numerous and complex problems connected with them.

The final event of this most successful meeting was a dinner at the Bellevue-Stratford on Friday evening. On this occasion

Professor Edgar F. Smith, president of the society, acted as toastmaster. Addresses were made by President Smith; Dr. Woodrow Wilson, president of Princeton University, who responded to the toast 'The Memory of Franklin'; Dr. Woodward, president of the Carnegie Institution; Dr. H. W. Wiley, of Washington; Professor W. B. Scott, of Princeton, and Professor W. T. Hewett, of Cornell.

SCIENTIFIC BOOKS.

The Whalebone Whales of the Western North Atlantic, compared with those occurring in European Waters, with some observations on the species of the North Pacific. By FREDERICK W. TRUE. City of Washington, published by the Smithsonian Institution. 1904. Pp. viii + 332; 97 text figures; 50 plates.

Those who are acquainted with the imperfect condition of our knowledge of whales, and particularly of the larger species, with the consequent multiplication of species and genera, will appreciate this memoir as well as realize the labor involved in its preparation. The objects of the work are to definitely decide the specific identity or difference of the species of whales occurring on the coast of Europe and America and to locate and identify the specimens on which the American species were based. These problems proved to be so involved that the subject of the distribution and migrations of the larger cetacea, which first led Mr. True to study the whales, had to be postponed.

That the synonymy of the larger cetacea should be involved is not surprising; owing to the practical impossibility of systematically collecting such animals, the greater part of the species are founded upon specimens, often fragmentary, that have accidentally come to hand, with the result that observations have been desultory and disconnected.

The first chapter of Dr. True's memoir is devoted to 'The Earliest References to Whalebone Whales in American Waters,' and this is full of information and interest to both naturalist and general reader, since it con-

tains much information as to the extent and methods of the early whale fisheries on the eastern coast of North America. We learn that at a very early date (by the middle of the sixteenth century) there was a regularly established whale fishery on the coast of Newfoundland, while it is rather saddening to see how abundant were whales in those early days. Surely if the killing of whales has any direct or serious effect on any other fishery this effect must have been felt many years ago.

Chapter two is 'A Chronological Account of Important Contributions to the Natural History of North American Whalebone Whales' and in it, under date of 1741, we have the first systematic summary of the then known or recognized American species, in which some of them appear under the common English names by which they are yet known. It is a striking commentary on the lack of knowledge, or rather the large amount of misinformation, regarding whales, to note that this list is quite as understandable, and decidedly more accurate, than Gray's synopsis published in 1871.

This leads naturally to 'A Review of Cope's and Scammon's Species,' in which the species of the Atlantic coast are ruthlessly slaughtered, while later on doubt is cast on the specific identity of the larger Pacific whales which may prove to be identical with those of the Atlantic.

Chapters four to eight contain a systematic review, with many details as to measurements and coloration, of the finback, sulphurbottom, little piked whale, humpback and North Atlantic right whale, abundant comparisons being made with the work of other writers. Here we get what we actually know regarding the size, proportions and coloration of these great animals, and before passing to the conclusions deduced from them it may be worth while to note one or two points about the sulphurbottom, which is the largest of vertebrates. By the courtesy of Mr. Pike and Captain Bull, of the Cabot Company, it is possible to supply the measurements of the flukes, which Dr. True was unable to obtain, and to say that in males respectively 74 feet 8 inches and 74 feet 4 inches from fluke notch

to tip of nose they were 16 feet 5 inches and 17 feet 2 inches in greatest spread. Various measurements of sulphurbottoms taken in 1903 agree with those taken by Dr. True, save that one female measured by him attained a length of 77 feet, or two feet more than any animal seen in 1903. As to the specimens noted abroad as having lengths of from 90 to 100 feet the reviewer frankly states his disbelief in their existence, though willing to grant that some giant may now and then reach a length over all, from tip of flukes to underhang of lower jaw, of 90 feet.

That the measurements of whales taken on the Norway coast should decidedly exceed those taken elsewhere is rather strange, and though it is barely possible that the largest animals occur there, the reviewer pleads guilty to a desire to measure one such animal himself, the more that it has never fallen to his lot to measure any animal that came up to the standard of size set by others. It is regrettable that the one measurement of a whale, from tip of nose to eye, that can be taken with certainty, is no safe criterion of the size of the animal, since the comparative length of the head is so extremely variable that there may be a difference of nearly a foot in this respect between two animals of equal length.

This naturally lessens the value of any ratios that may be made between the proportions of two whales. It is both interesting and discouraging to see how measurements of whales vary, but a part of the discrepancies shown may be explained by the difficulty commonly experienced in measuring cetaceans, while others are due to a failure to state how certain measurements were taken. This may possibly explain why Dr. True finds the flukes of the Newfoundland humpbacks wider than in European specimens, quoting 15 feet 8 inches and 17 feet 2 inches for whales respectively 42 and 45 feet long. A very accurate measure of the flukes of a humpback 50 feet long, following the curve of the back, gave a spread of only 13 feet 8 inches. It is also probable that the flukes show a great range of variation, as do the flippers.

Chapter ten gives the conclusions based on

Dr. True's studies, and these are that several American species which have been proposed are quite nominal and that, as a whole, the species of the Atlantic coast of North America can not be distinguished from those of European waters. Further, the whales of the Pacific coast, with the exception of the gray whale, bear an extremely close resemblance to those of the Atlantic, although at present material is not available to definitely determine whether or not they are specifically identical.

The eastern species admitted by Dr. True are the finback, *Balaenoptera physalus* (Linn.); sulphurbottom, *B. musculus* (Linn.); little piked whale, *B. acuto-rostrata* Lacépède; pollack whale, *B. borealis* Lesson; humpback, *Megaptera nodosa* (Bonnaterre) and North Atlantic right whale, *Balaena glacialis* Bonnaterre. These scientific names are those recognized after a careful study of the literature and are practically those adopted in Dr. True's paper of 1898, since he noted that *M. nodosa* had been applied to the American humpback prior to the use of *M. longimana* for that taken on the European coast.

It is certainly a relief to see the species of cetacea rescued from the maze of synonymy in which they have for many years been involved, and if any one is so unfortunate as to come upon some unique work that would change any of the above names it is to be hoped that he will promptly destroy it and thus earn the gratitude of posterity.

The fifty plates, with from two to four figures on a plate, are devoted to reproductions from photographs of crania and other important parts of the skeletons, and many views of stranded whales and whales lying on the slips at whaling stations. The index is one that not even the *Nation* can criticize and Mr. True is to be congratulated upon the successful completion of a long and difficult piece of work.

F. A. L.

TWO RECENT MOSS BOOKS.

Dr. A. J. GROUT has just published a second edition of 'Mosses with a Hand-Lens,'* which

* 'Mosses with a Hand-Lens.' Second edition with Hepatics, pp. xvi + 208. March, 1905.

includes also some of the more common hepatics. The new edition, which follows the same general plan as the first edition, is expanded, to include 169 of the 'more common and more easily recognized mosses of the northeastern United States,' as well as fifty-four of the hepaticæ of the same region.

The descriptions are non-technical, and only such characters are employed as, according to the experience of the author, can be determined by the use of a powerful hand-lens. The key to the families of mosses is followed by a *brief* introduction and a *short* consideration of the life history and general structure of mosses. The last topic could be somewhat expanded with profit to the student. The text contains something like 118 figures and 39 full-page plates, the latter reproductions very largely from the *Bryologia Europæa*, which is a sufficient guarantee of their excellence. Many of the figures are rather lacking in clearness of detail, but in the matter of typography and illustrations, the work is so much of an improvement over its predecessor that it deserves special commendation.

To those who are without the advantages of a compound microscope and can not afford the author's more complete book, 'Mosses with Hand-Lens and Microscope,' this little volume will prove a valuable aid. If it serves as a stimulus to a more detailed study of this very interesting group of plants, its existence will be justified.

Many students of mosses will probably welcome the appearance of 'Moose' by Dr. W. Migula.* Although the work is primarily intended for German students, it contains much that will be valuable for American students, and its reasonable price places it within the reach of all.

The first chapter deals with the structure of the moss-plant, and the general features of

\$1.75. Published by the author, 306 Lenox Road, Flatbush, Borough of Brooklyn, New York City. Also O. T. Louis Co., 59 Fifth Ave., New York City.

* Band I. 'Moose,' in Band V. of Professor Dr. Thome's 'Flora von Deutschland, Oesterreich, und der Schweiz.' Pp. vi + 512. 19 M. 1904. Friedrich von Zezschwitz. Gera, R.